

**TABLE 4-2 PROPERTIES AND BIOLOGICAL ACTIVITIES*
OF CLASSES AND SUBCLASSES OF HUMAN SERUM IMMUNOGLOBULINS**

Property/Activity	IgG1	IgG2	IgG3	IgG4	IgA1	IgA2	IgM†	IgE	IgD
Molecular weight†	150,000	150,000	150,000	150,000	150,000– 600,000	150,000– 600,000	900,000	190,000	150,000
Heavy-chain component	γ1	γ2	γ3	γ4	α1	α2	μ	ε	δ
Normal serum level (mg/ml)	9	3	1	0.5	3.0	0.5	1.5	0.0003	0.03
In vivo serum half life (days)	23	23	8	23	6	6	5	2.5	3
Activates classical complement pathway	+	+/-	++	–	–	–	+++	–	–
Crosses placenta	+	+/-	+	+	–	–	–	–	–
Present on membrane of mature B cells	–	–	–	–	–	–	+	–	+
Binds to Fc receptors of phagocytes	++	+/-	++	+	–	–	?	–	–
Mucosal transport	–	–	–	–	++	++	+	–	–
Induces mast-cell degranulation	–	–	–	–	–	–	–	+	–

*Activity levels indicated as follows: ++ = high; + = moderate; +/- = minimal; – = none; ? = questionable.

†IgG, IgE, and IgD always exist as monomers; IgA can exist as a monomer, dimer, trimer, or tetramer. Membrane-bound IgM is a monomer, but secreted IgM in serum is a pentamer.

‡IgM is the first isotype produced by the neonate and during a primary immune response.

K U B Y IMMUNOLOGY

*F O U R T H
E D I T I O N*

RICHARD A. GOLDSBY
Amherst College

THOMAS J. KINDT
National Institutes of Health

BARBARA A. OSBORNE
University of Massachusetts
at Amherst



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